The Standardized Infant NeuroDevelopmental Assessment: validation of a new scale

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Several standardized infant neurological examination tools exist, such as the Touwen Infant Neurological Examination, Amiel-Tison Neurological Assessment, and the Hammersmith Infant Neurological Examination (HINE). Of these, the HINE is the most well-known. It can be used to identify early signs of cerebral palsy (CP) and provides useful additional information on the type and severity of motor sequelae, and other aspects of neurological function such as vision or feeding difficulties.[1]

Hadders-Algra et al.[2] present the first phase in the validation of a new tool: the Standardized Infant NeuroDevelopmental Assessment (SINDA) neurological scale. They assessed the reliability of the SINDA in a cohort of 181 high-risk infants (83% born preterm) with a median(range) age at assessment of 3 (3-12mo) in a non-academic clinical setting. The SINDA has three scales and this study addresses one of them, the neurological scale. Many familiar with using the HINE will observe there

are several similarities with the SINDA, but also some differences. Most notably, the neurological scale of the SINDA has been constructed to be largely independent of the infant's age and includes several more items evaluating the quality of spontaneous movements. The study found that a SINDA score cut-off less than the 25th percentile resulted in sensitivity and specificity values for the prediction of CP comparable with the HINE. The ability of the scale to predict atypical outcome but not CP, (Bayley Scales Mental Developmental Index and/or Psychomotor Developmental Index scores less than 70 at 24mo) is also reported as having 78% sensitivity and specificity of 94%. The authors suggest this good predictive value may be due to the inclusion of items related to spontaneous motor behaviour and it is interesting to note that infants in the atypical outcome group without CP predominantly had Mental Developmental Index scores less than 70.

It is challenging finding adequate methods to detect risk of developmental disorders other than CP during early routine screening (and in the absence of early magnetic resonance imaging), particularly in relation to cognitive impairment. However, the link between the quality of emerging motor performance and later cognition is a developing area of research. A systematic review by Einspieler et al.[3] concluded that consistently abnormal General Movements Assessment up to 8 weeks post-term age, and the qualitative and quantitative aspects of motor behaviour during the subsequent 3 to 5 months, were associated with lower cognitive abilities at school age. In addition, Heineman et al.[4] found

that atypical movement behaviour during later infancy (at 4mo, 10mo, and 18mo) assessed using the Infant Motor Profile was associated with lower IQ at 4 years.

Lower HINE scores in infants at 3 months of age have been found to be associated with mild disability defined as no CP and a Clinical Adaptive Test/Clinical Linguistic and Auditory Milestone Scale (receptive and expressive language and visual-motor problem-solving skills) quotient less than 70 at 24 months.[5] Additional studies investigating the relationship of the HINE with later non-motor outcomes are indicated.

Validation of the SINDA neurological scale is in its infancy, however the finding that it might have the potential to predict later atypical outcome, as well as CP, independent of the age at which it is administered and in a non-academic clinical setting, is promising. Before recommendation into regular use, the scale needs to be more fully explored, specifically in the low-risk population for which it was designed. Following this, the obvious next step would be to compare the ability of SINDA and HINE to predict different outcomes in the same cohort.

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